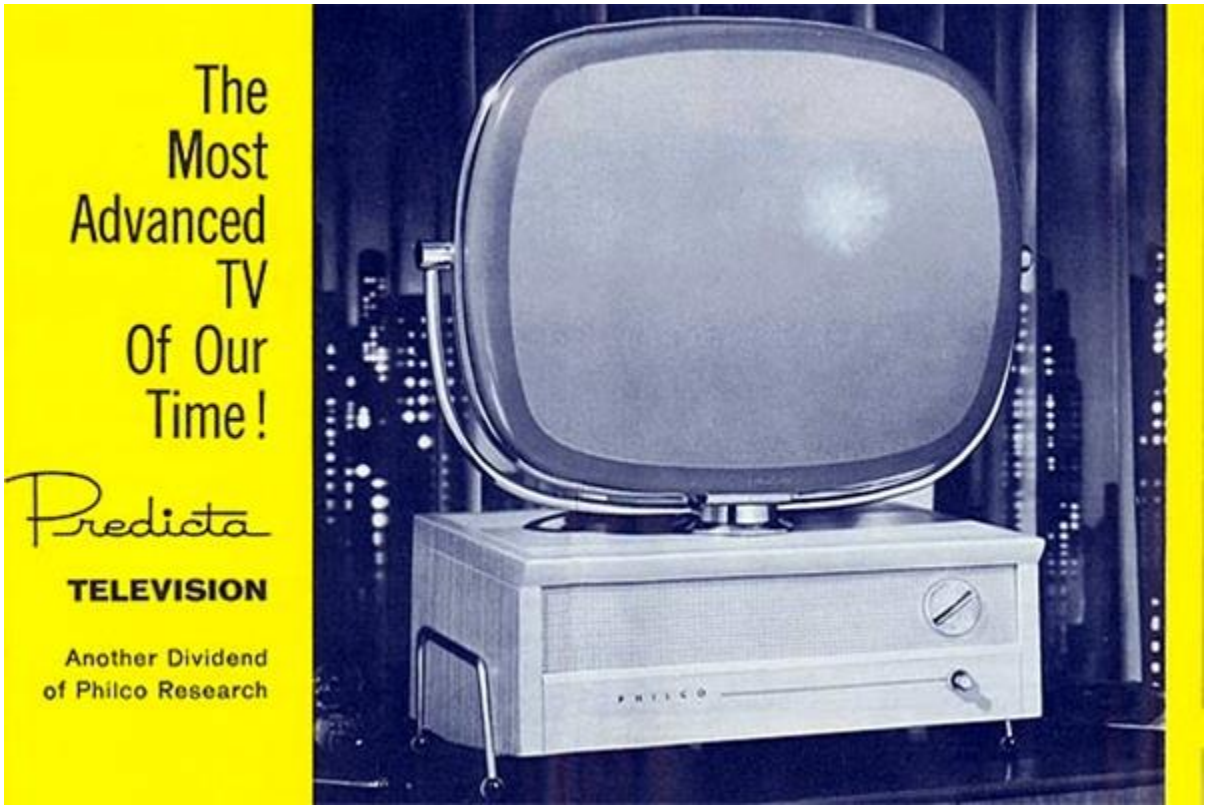
Philco Predicta

Repair Hints



About Me

- Got into old TV's as I wanted a different challenge than radios
- Repaired a Predicta for a friend 2 years ago
- Became interested in the design and history of these sets
- Worked on many since then
- Haven't gone crazy working on these… yet

Disclaimer:

- I am not a formally-trained technician- just a hobbyist
- The information contained herein is based on personal research and experience
- Others may have different experiences or know other repair procedures
- Use this information at your own risk

Assumptions

- You are familiar with basic TV restoration and troubleshooting principles
- You have and know how to use basic test equipment and tools

(Yeah… Right!)

So You Own a Predicta…

- Owning a Predicta can seem scary-
  - “The Edsel of televisions!”
  - “The set that bankrupted Philco!”
  - “Every shop in town hated those sets”
  - “They are a pain in the @ss to work on”
- Yes, they have their issues, but with care, patience and persistence they can be made to work properly
- Don’t be scared of it- “Man made it, thus man can fix it”

Models

Holiday

Tandem

Pedestal

Continental

Debutante

Princess

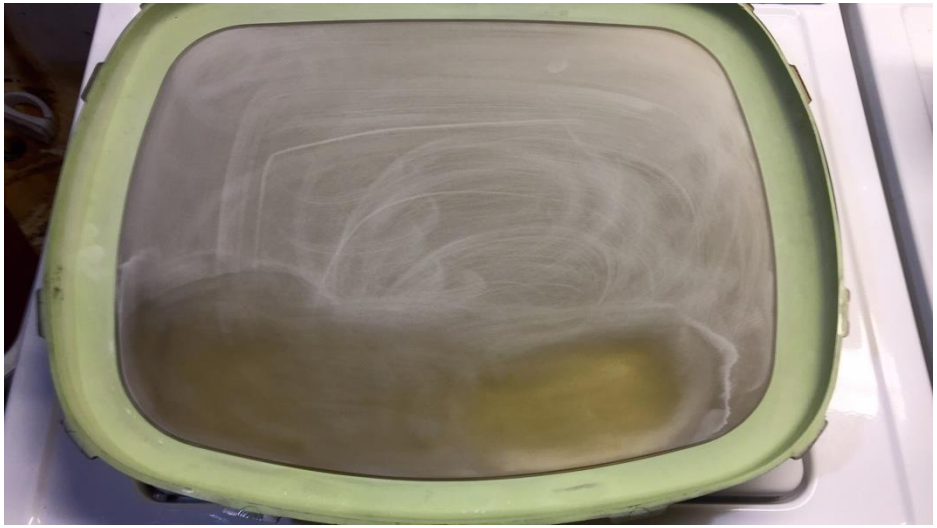
Siesta

Common Issues

- Screen Covers
- CRT’s
- Antennae
- Corrosion
- Flybacks
- Woodgrain Condition (Holidays/Tandems)
- Umbilical Cable Condition (Tandems)

Screen Covers

- Screen covers on 21” sets prone to material degradation, some more so than others
- Some covers develop a waxy, chalky buildup on both sides; tends to have bad smell (buteric acid)
- Made from “Tenite®” plastic
- Green tint is normal
- Degraded material can be removed via polishing
- 17” Models used different material; no oxidation issues



CRT’s

- 17” CRT’s were fairly reliable
- 21” CRT’s prone to premature cathode emission failure
- Originals used non-standard filament voltage (2.34V/2.68V) – Be careful testing!
- Many 21” sets were upgraded with common 6.3V @ 600mA heaters (21FDP4, others)
- Modified 21”sets typically have jumper on last section of filament dropping resistor and sometimes have a placard inside the cabinet or CRT housing indicating replacement

Antennae

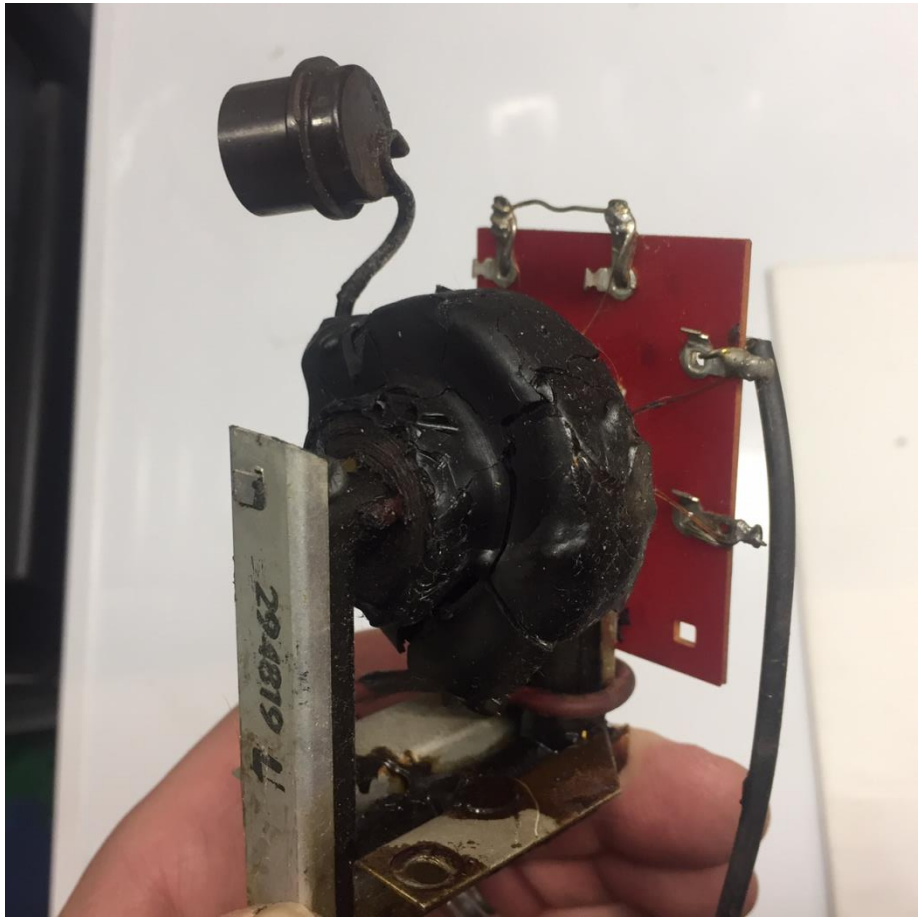
- Original telescoping antenna was designed to be stored internally
- Most antenna masts are broken off and missing
- Replacement can be fabricated and installed
- Pedestal and Continental used built-in antenna

Corrosion

- The decorative metal pieces on the CRT housing (side brackets, plugs and base) are made from steel with a thin brass plating that is prone to corrosion
- If the finish is in good condition, use care when polishing
- The front trim bar on the Holiday sets is anodized aluminum

Flybacks

- The coating on the flybacks often looks in poor condition, with cracks and missing chunks
- Looks can be deceiving, the flyback may look horrible, but still test and function well.



Cabinet Woodgrain

- The faux woodgrain pattern on Holiday cabinets is screen printed
- If there are any blemishes in the finish, they must be repaired and the woodgrain painted in by hand
- The cabinet on the some Tandem models is wood veneer on plywood and does well with traditional refinishing methods
- Cabinets on other models are painted, or a mixture of painted and finished pieces

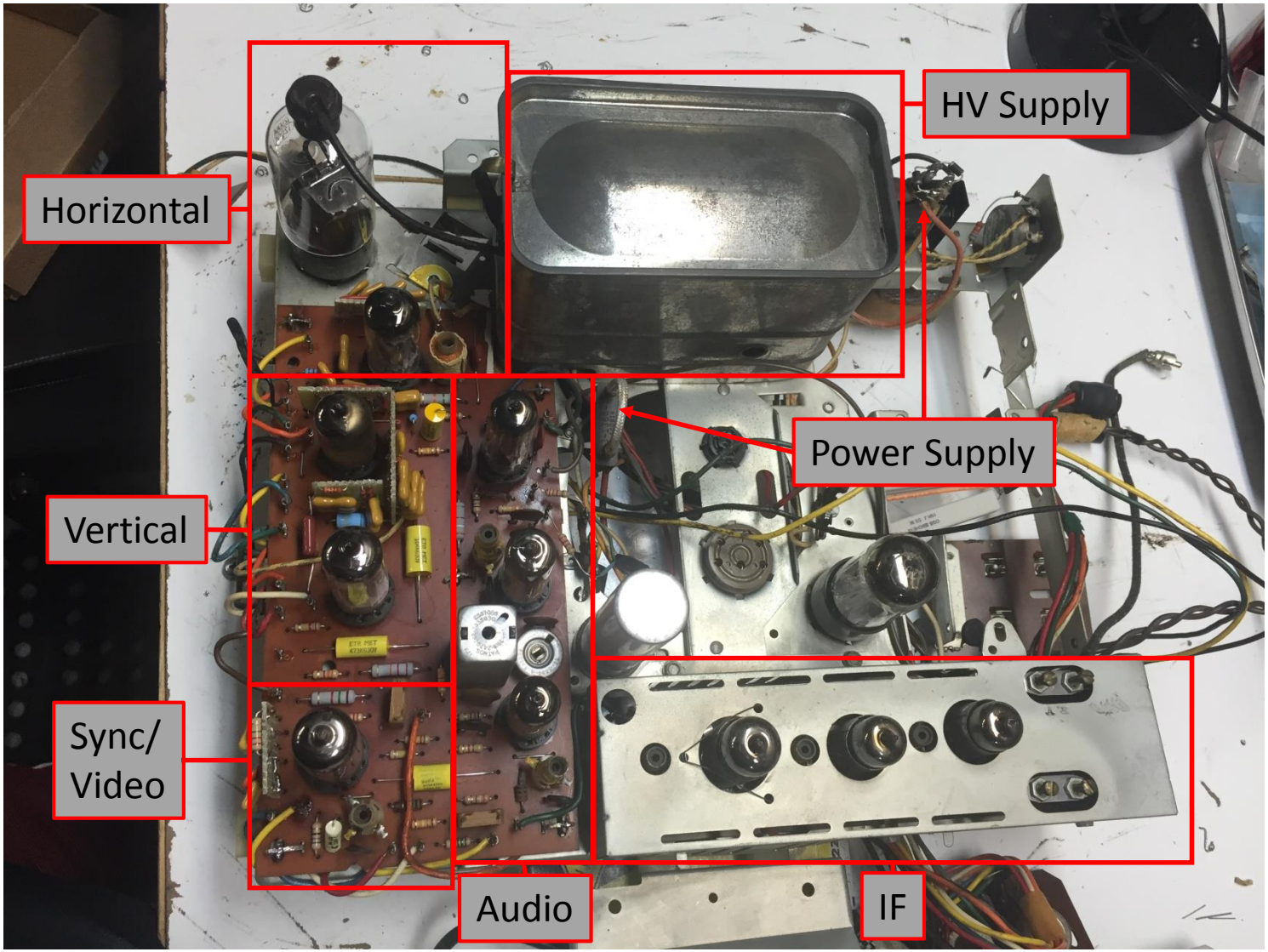
Umbilical Cable Condition- Tandem

- Often the cable will have a sticky, filthy coating on it from plasticizer leaching out of the insulating jacket
- This can easily be cleaned up using citrus hand cleaner or acetone
- The cable should be checked for continuity in the case of broken wires (fatigue from rolling up cable, damage from walking on, etc.)
- Check for broken pins in socket
- Cable may be shortened slightly; but may cause picture issues (designed for length of cable)

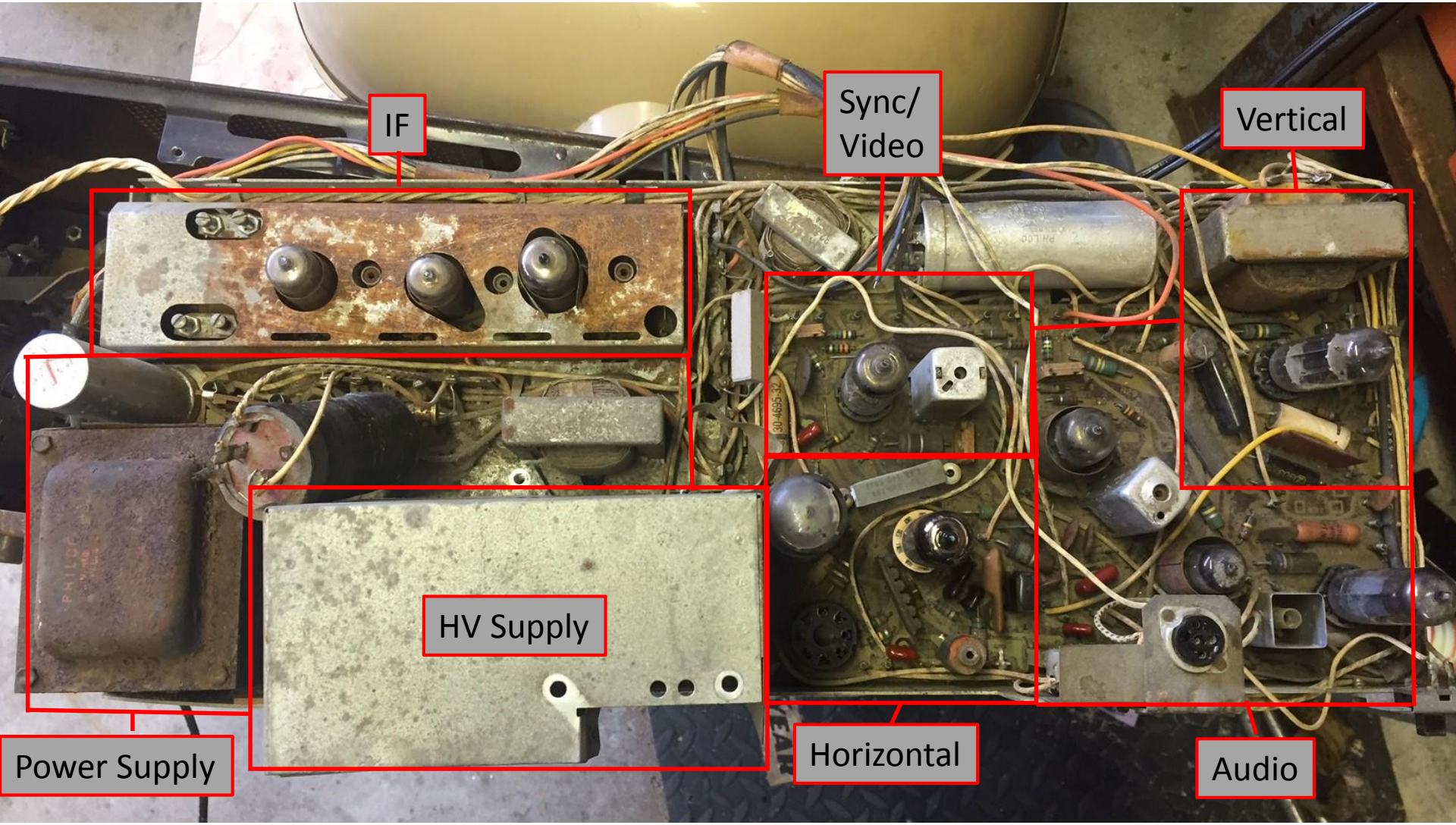
Component Layouts

- “9L3X” Series – “Hot” Chassis
  - 9L37 Holiday and Pedestal
  - 9L37U Holiday and Pedestal with UHF Tuner
  - 9L38 Tandem
  - 9L38U Tandem with UHF Tuner
  - 9L38A Tandem with Audio Amplifier
- “10L4X” Series – “Cold” Chassis
  - 10L41 17” Models with 5U4 Rectifier
  - 10L43 17” Models with Silicon Diodes
  - 10L43A 21” Model with Tone Control

9L3X Chassis Layout



10L4X Chassis Layout



Common Replacement Items

- Tubes
- CRT
- Inrush Current Limiter (Thermistor)
- Fused Resistor (a.k.a. “Fusistor”)
- RC Networks (Couplates)
- Fine Tuning Mechanism

Replacement Tubes

- Predictas can be finnicky about the tube quality
- When replacing tubes, try to use tubes of reputable brands
- Good tubes: RCA, Tung Sol, Sylvania or GE
- Avoid: Raytheon, Standard Brand, Lindal, Rauland
- While tubes may test well, have some handy for substitution

CRT

- 17” Models (SF17/17DAP4) are typically reliable
- 21” Models (SF21A/21EAP4) had more issues
- Most OEM 21” CRT’s used 2.34V @ 450ma filaments
- OEM 17” CRT’s used 2.68V @ 450ma filament
- Continental is a special case (21EVP4- 21” CRT run from 17” chassis design)

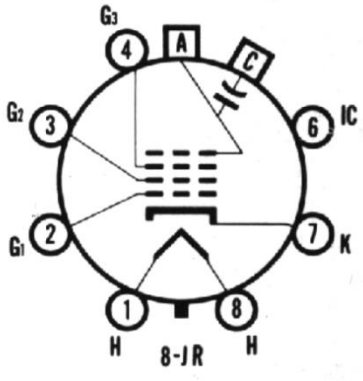
Replacement CRT's

- 21" 21EAP4: Many replacements:
  - 21FDP4 (Most common)
  - 21FAP4
  - 21EVP4 (18Ω shunt resistor needed for series string sets)
  - 21EMP4 (G1 and G2 swapped)
  - 21CEP4 (Longer neck, G1<->G2)
  - 21ESP4 (Longer neck, G1<->G2)

(When converting a set to use a 6.3V CRT, the last leg of the filament dropper resistor was fitted with a jumper wire. With higher modern line voltage, this isn't always necessary)

Replacement CRT’s

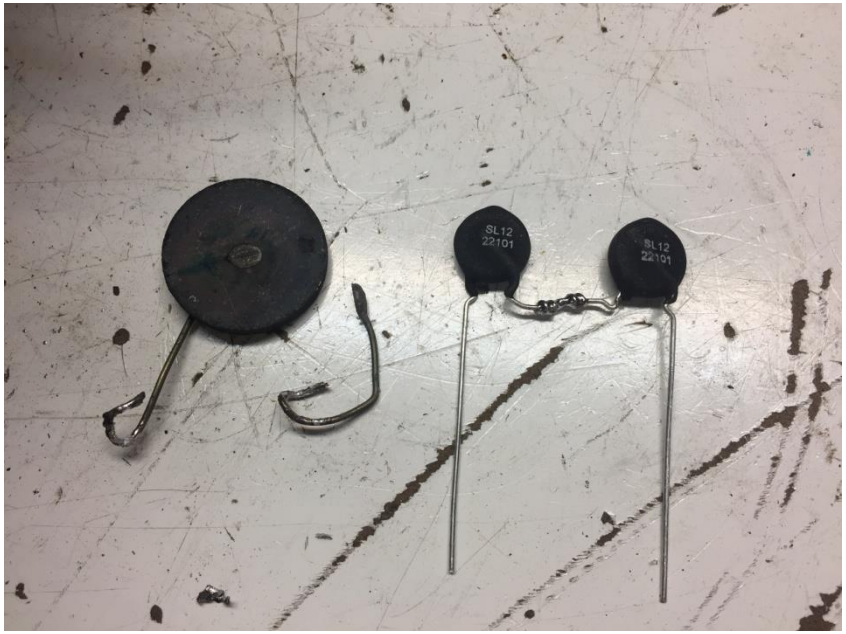
- 17” 17DAP4 (Same CRT used in Philco “Seventeener” portable):
  - 17DEP4 (2.35V @ 600ma)
  - 17DKP4
  - 17DRP4
  - 17DTP4 (6.3V @ 600ma)
  - 17DXP4 (6.3V @ 450ma)
  - 17DZP4 (6.3V @ 450ma)



- Other 17” 110° CRT’s can be used, but the neck may be too long for the CRT housing, requiring modification

Inrush Current Limiter

- Provides “Soft start” for tube filaments
- Original part usually defective or broken
- May be substituted with 2 Amertherm SL21 22101 thermistors wired in series



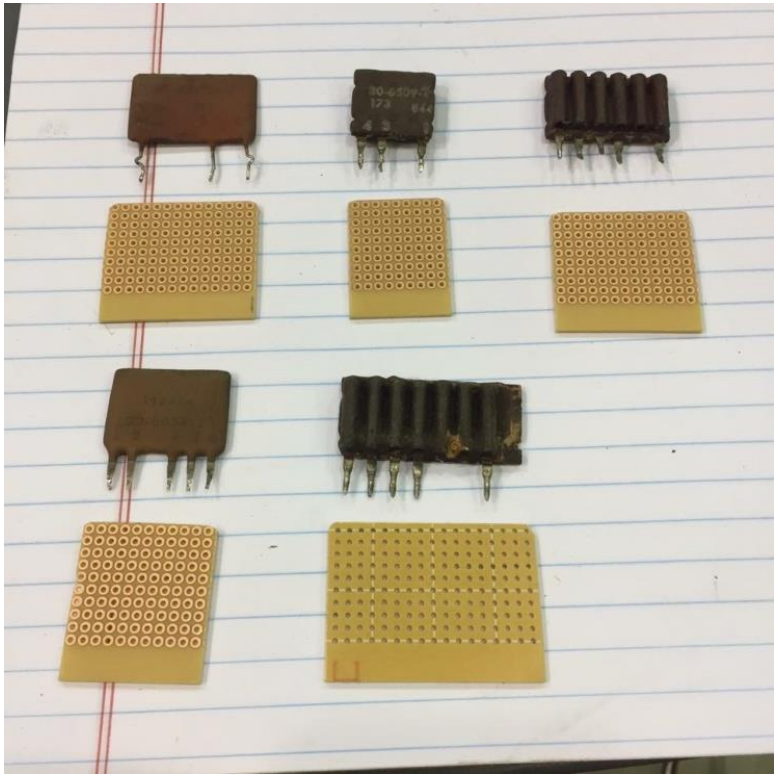
Fused Resistor

- Protects power supply in case of short
- Limits current surge to PS diodes at switch-on
- Some are found defective or destroyed
- Can be substituted with separate 5.6Ω 10W wirewound resistor and 1.0A Slow-blow fuse

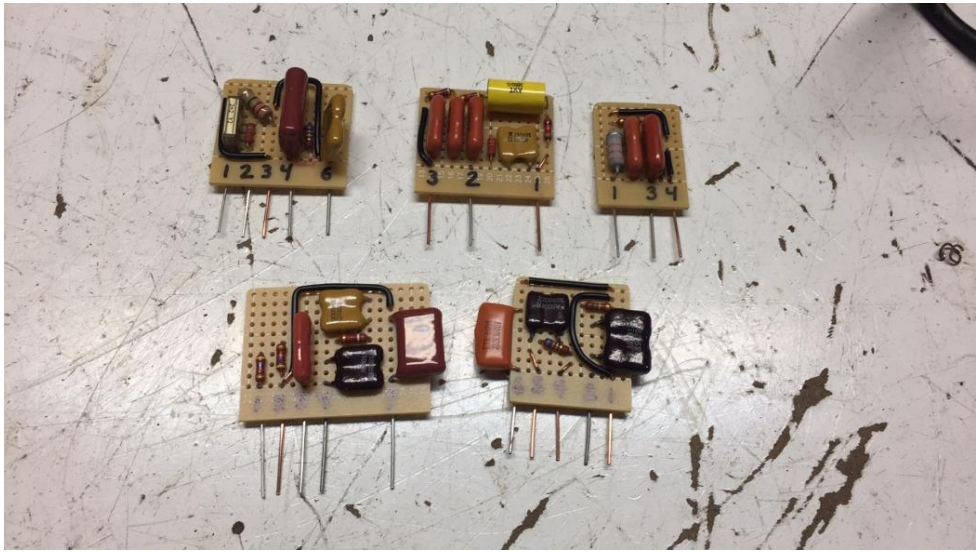
RC Networks

- Component combinations used to facilitate production
- Ones in vertical section more prone to failure
- May be replicated using discrete components mounted on a small breadboard
- Capacitors should be rated for 1kV, either film or mica – avoid ceramics due to temperature drift, unless NP0/C0G rated
- Resistors should be rated at 1 watt

RC Networks



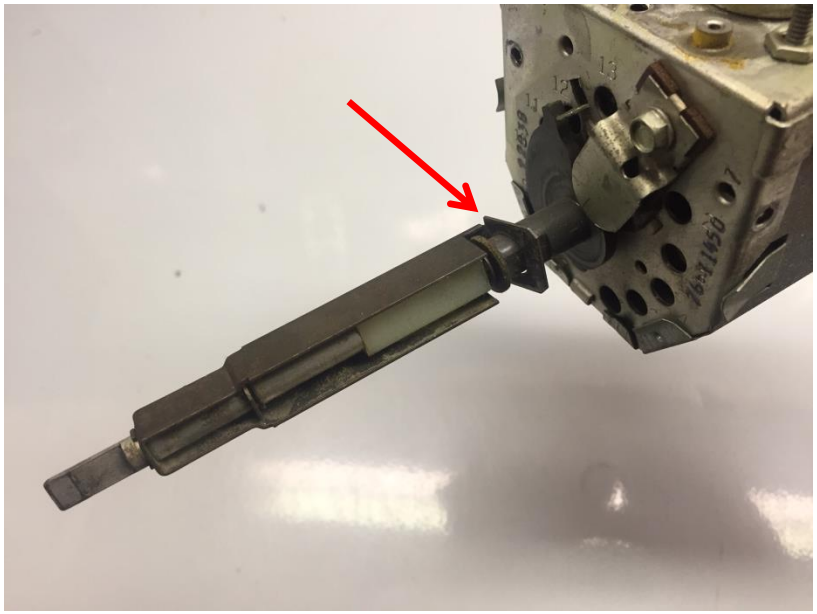
Perf boards cut to size



Finished boards with discrete components and jumpers

Fine Tuning Shaft

- Plastic portion of fine tuning variable capacitor is prone to wear
- Worn area may be repaired with epoxy and smoothed down, or metal tab on shaft may be repositioned



Service Hints

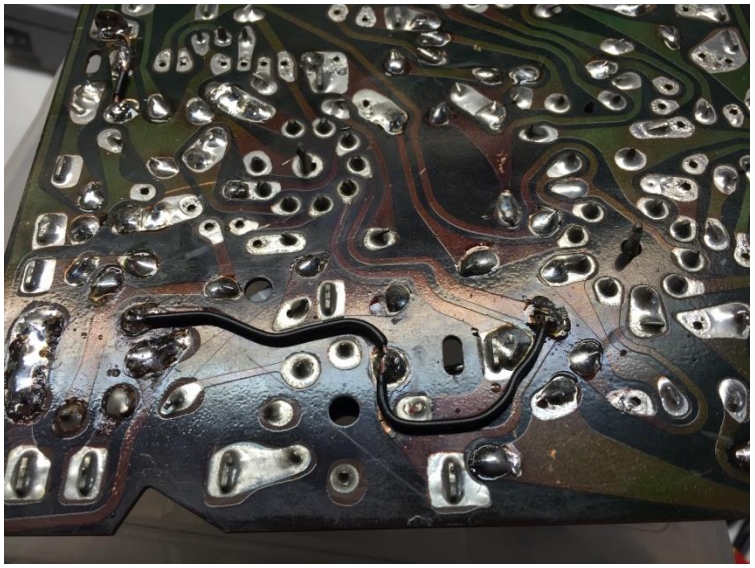
- Board Removal
- Board Repair
- Tube Sockets
- Board Installation
- Flyback Sealing
- PS Diodes
- Vertical Linearity Picture Collapse
- Screen Cover Restoration

Board Removal

- All external wiring connections to the board were made with wire wrap posts
- A wire unwrapping tool makes the job much easier
- The boards are affixed to the chassis via solder lugs

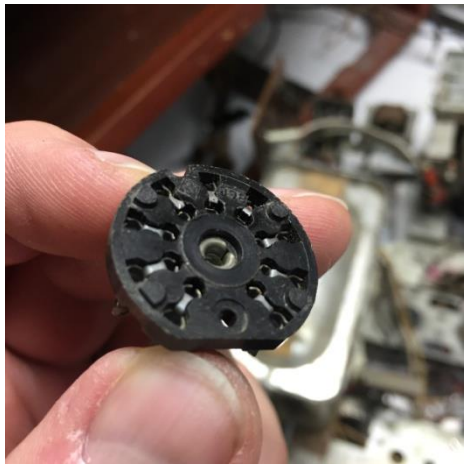
Board Repair

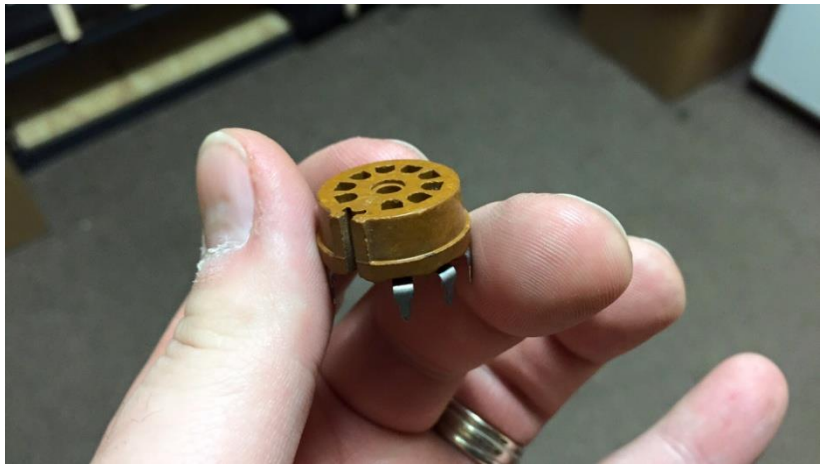
- Due to heat build-up, boards can become brittle and/or traces can break
- Traces can be repaired by routing new leads along path of original trace
- Traces can lift with too much heat- use lowest iron setting that still yields good solder joints
- Re-flow solder on all connections
- Denatured alcohol can be used for board cleaning



Tube Sockets

- Due to nature of their design, tube sockets are prone to breakage of the socket pins
- These breakages are hard to see- each socket must be tested prior to reassembly
- Using a test socket gives an easy and reliable way to test each pin for continuity





Board Reinstallation

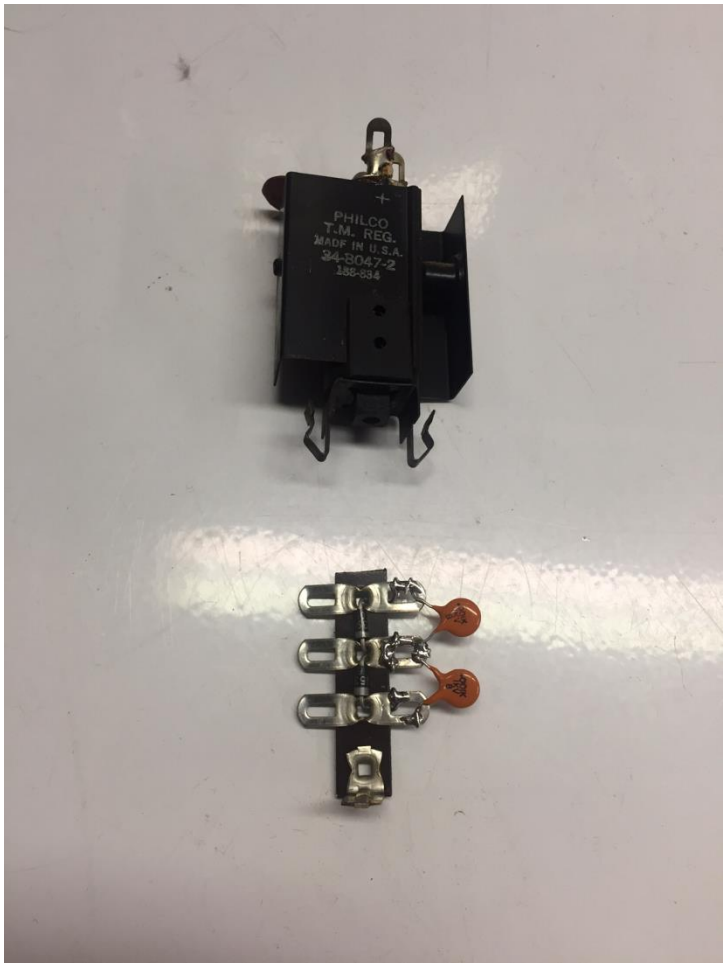
- If there is enough slack in the wires, they can be bared and re-wrapped on the terminal posts
- Some prefer to solder these connections
- Terminals should be cleaned with a burnishing tool or Dremel
- When soldering, a heat sink should be placed at the bottom of the pin to prevent a bad solder joint on the board
- Ensure that all ground connections are properly soldered- the VOS board grounds are not on a common bus

Flyback Sealing

- While most flyback transformers test good, they typically have poor visual condition
- The outer coating is typically cracked and a piece is often melted/missing
- Flys with minor coating damage can be recoated and stabilized with corona dope
- Flys missing much of their coating can be recoated with special “Sensor Safe” RTV silicone

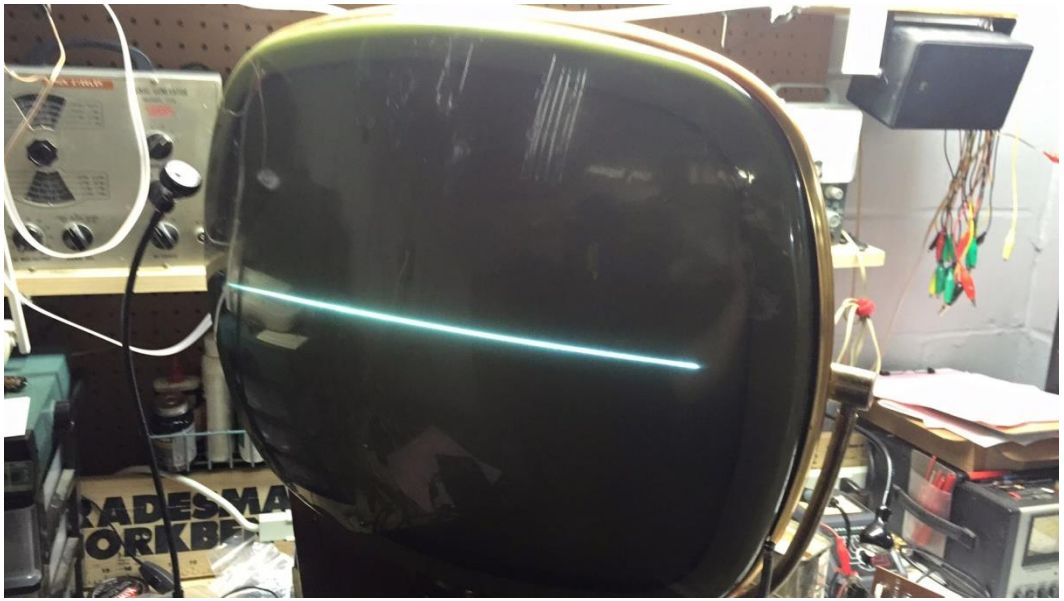
Power Supply Diodes

- Most models used germanium rectifier diodes, often in some form of snap-in configuration
- These diodes can become leaky and require replacement
- Modern silicon diodes (1N4007) can be used
- The diodes can be mounted on the existing rectifier (original diodes must be isolated), or mounted on a nearby terminal strip



Vertical Linearity Collapse

- Sometimes a set can display a flat horizontal line, despite being repaired
- In some cases the vertical linearity pot may be faulty, not allowing full raster deflection until near the end of travel



Screen Cover Restoration

- The build-up of degraded material needs to be polished off
- A headlamp restoration kit works well
- After polishing, coat the cover with paste wax to help seal the plastic from the ambient air and slow further deterioration

CRT Shell Trim Band

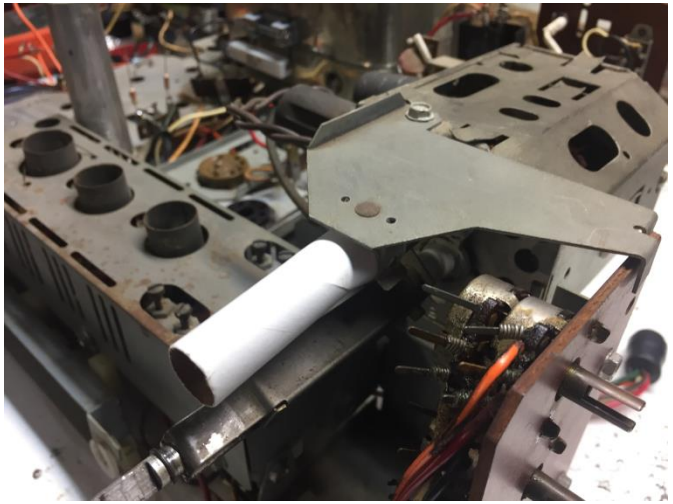
- The trim band that covers head shell band is attached via a spring in the base
- The easier way to mount the trim band is to hook the spring on each end, pull apart and place on the bottom corners
- Work your way up each side, working trim into place
- Finish at top of shell

“Hacks”

- Light Guide
- Antenna
- HO Tube Plate Wire Guard
- Line Cord Replacement

Light Guide

- The pilot lamp is covered with a cardboard light guide
- The pilot lamp (#44) runs hot and over time the cardboard deteriorates and crumbles
- A ½” ID model rocket body tube can be used as a replacement

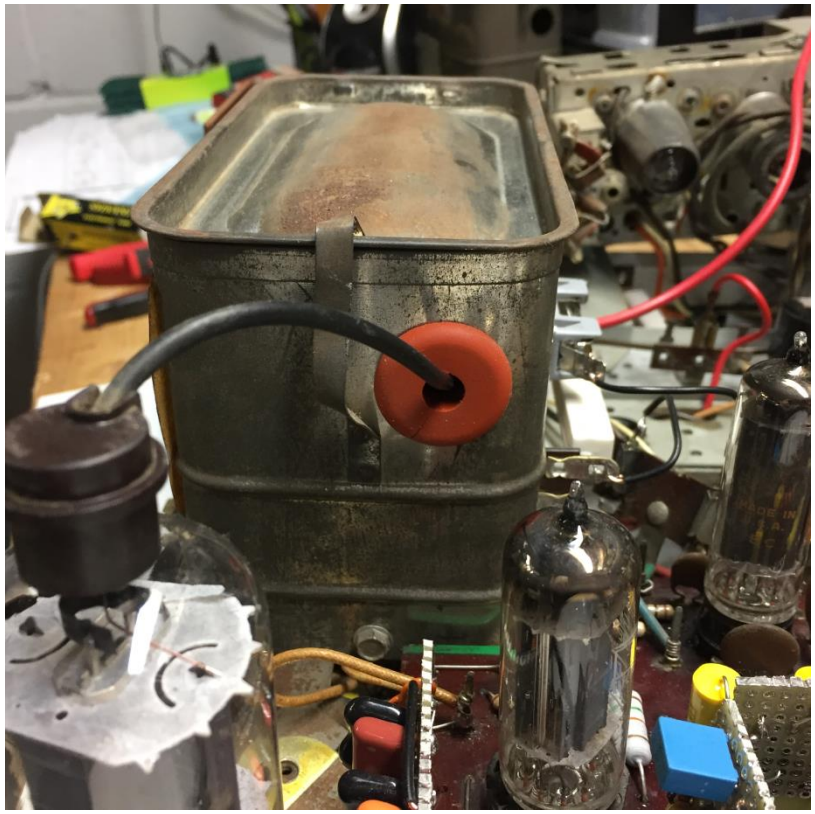


Antenna

- A telescoping brass swivel-type antenna may be substituted for a missing original
- The Zenith Chromatenna is a good source
- The antenna can be cut out and mounted with the original hardware

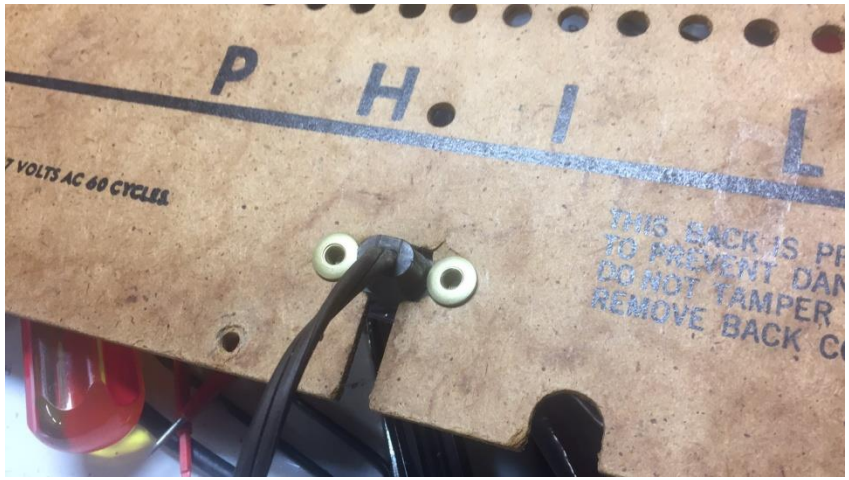
HOT Wire Protection

- There is a fish paper holder to keep the HOT plate lead from chafing on the edge of the hole in the flyback housing
- Often this holder has cracked and fallen apart
- A silicone grommet can be used
- Good up to 500°F; available from McMaster-Carr



Cord Replacement

- Units use non-polarized cheater cord; 21” models use “eared” versions
- Replacement cord ears can be heated and slipped over original rivets
- If rivets are missing, flanged aluminum fasteners can be substituted



Oddities

- Extra Resistor on Sync Separator Network
- Jumper on Flyback Resistor
- Tandem Flyback Fins

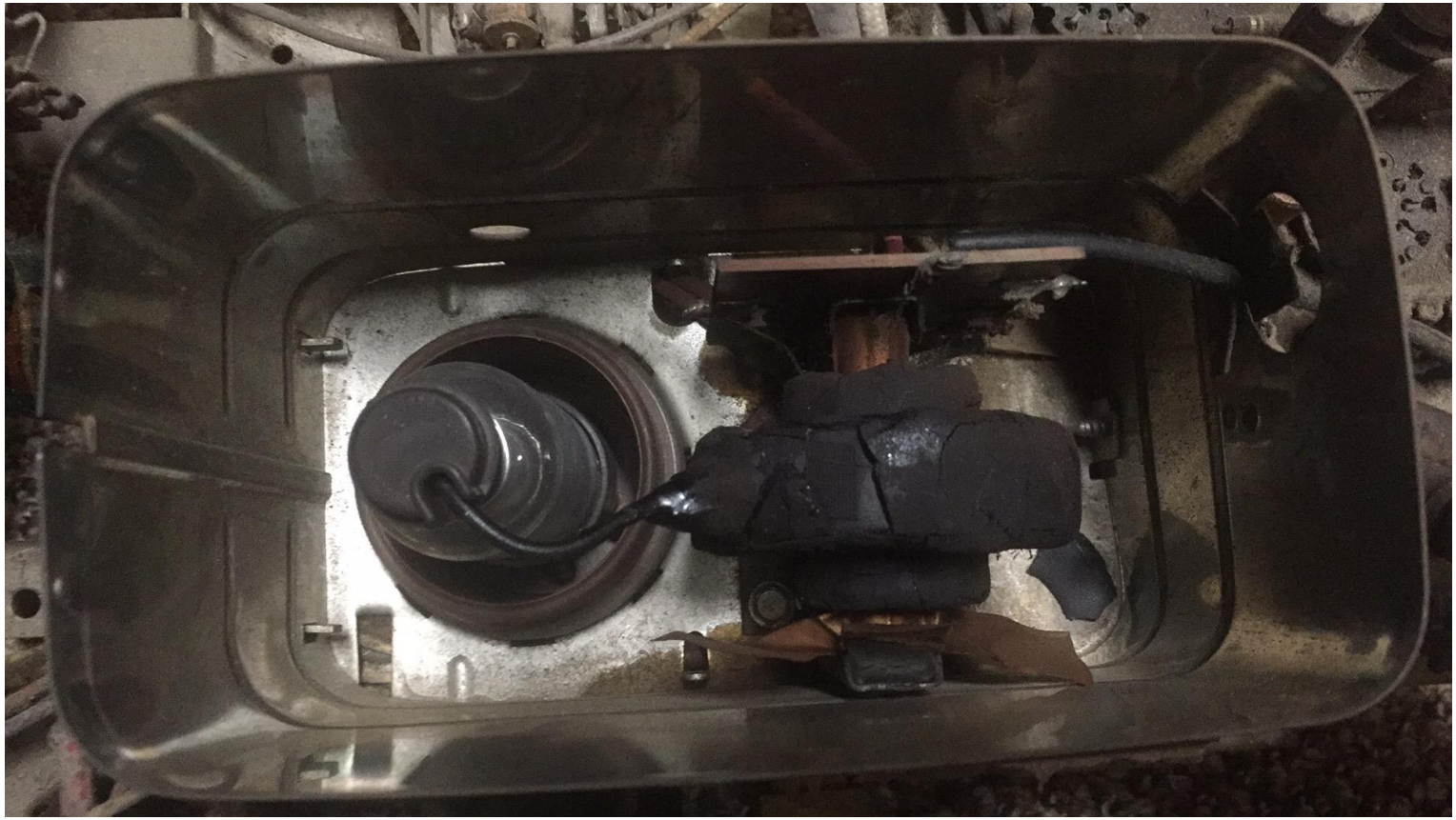
Sync Network Resistor

- Some Tandem models have a sync separator network with an extra resistor soldered onto it
- This was a factory modification- not a field repair
- The part numbers are different between the Holiday and Tandem- this is a Holiday network altered to work in a Tandem set

Flyback Jumper

- On top of the flyback terminal board there is a 2 Watt 15Ω resistor
- In most instances this resistor will have a jumper wire across it
- This is a factory modification

Flyback Fins (Tandem)



While similar to the 9L37 type, this HOT has cooling fins
They look homemade, but they are factory

Closing

- Yes, Predictas have issues, but with some knowledge these issues can be mitigated
- Take your time and be patient!
- “It’s easy to get Predictas ‘working’, but not as easy to get them working ‘right’” – Charles Murray